Claims

1. A method for detection of a failure of an air consumer circuit in a compressed air system for vehicles, wherein the actual value of a variable of state (pressure, air flow rate, air mass, energy) in the compressed air consumer circuits is continuously measured and is evaluated in an electronic control unit, **characterized by** the following steps:

    - comparison of the values of the variable of state and/or of the negative gradients of the variable of state of the compressed air consumer circuits with a respective threshold value, and

    - shutoff of the compressed air consumer circuit in question when the values of the variable of state and/or of the negative gradient of the variable of state satisfies a circuit-failure criterion.

2. A method according to claim 1, **characterized in that** the circuit-failure criterion is satisfied when the values and/or gradients of the variable of state are below the respective threshold value for a time t equal to or longer than the time t_{dyn} of a dynamic change of the variable of state or of a dynamic collapse of the variable of state ($t \geq t_{dyn}$).

3. A method according to claim 1 or 2, **characterized in that** the threshold value of the variable of state corresponds to the value of the variable of state to be adjusted in the respective compressed air consumer circuit.

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4.   A device for detection of a failure of a compressed air consumer circuit with a
     compressed air system, which is provided with a compressed air supply part
     provided with a compressor and a consumer part with a plurality of compressed
     air consumer circuits, which are supplied with compressed air via electrically
     actuatable valves, wherein the pressure in the compressed air consumer circuits is
     monitored by sensors, whose electrical signals are evaluated by an electronic
     control unit that controls the electrically actuatable valves, **characterized in that**
     the electrically actuatable valves (16, 18, 20, 22) of the compressed air consumer
     circuits (26, 28, 30, 32, 34, 36) are open and in that, for detection of the failure of
     a compressed air consumer circuit, the control unit (84) compares determined
     values of a variable of state (pressure, air flow rate, air mass, energy) and/or
     negative gradients of a variable of state with a respective threshold value and
     identifies a compressed air circuit as a defective or failed circuit, and it switches
     the valve associated with this compressed air consumer circuit to blocked state in
     order to shut off the circuit in question if the pressure values and/or negative
     pressure gradients thereof satisfy a circuit-failure criterion.

5.   A device according to claim 4, **characterized in that** the circuit-failure criterion
     is satisfied when the values and/or gradients of the monitored variable of state are
     below the respective threshold value for a time t equal to or longer than the time
     t_{dyn} of a dynamic change of the variable of state or of a dynamic collapse of the
     variable of state ($t \geq t_{dyn}$).

6.   A device according to claim 4, **characterized in that** the threshold value of the variable of state corresponds to the value of the variable of state to be adjusted in the respective compressed air consumer circuit.

7.   A device according to claim 4, **characterized in that** the electrically actuatable valves are solenoid valves.